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10/534,735	05/12/2005	Jorgen S Nielsen	2173-230	9054

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EXAMINER	
VLAHOS, SOPHIA	
ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/534,735	NIELSEN, JORGEN S	
	Examiner	Art Unit	
	SOPHIA VLAHOS	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 May 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 8/15/08, addressing the 35 U.S.C. §112 first paragraph rejection of claims 3-4, 8, 21-22 have been fully considered and are persuasive. The rejection of claims of 4, 8, 21-22 under 35 U.S.C. 112 § first paragraph has been withdrawn.

2. Applicant's arguments filed (8/15/08) addressing the 35 U.S.C. §112 first paragraph rejection of claims 5, 10-11 (and 23-24, 26) have been fully considered but they are not persuasive.

Applicant argues:

"Applicant respectfully submits that the specification is sufficiently enabling to a person of ordinary skill in the art. Applicant respectfully submits that a patent application need be written only for a person of ordinary skill in the art and not for a novice. In In re *Gay, 309 F.2d 769, 135 USPQ 331, 316 (C C.P.A. t962)* the CCPA stated that "[n]ot every last detail is to be described, else patent specifications would turn into production specifications, which they were not intended to be." In

General Elecfric Co. v. Brenner. 407 t,]2d 1258, 159 USI'Q 335, 337 (D,C. Cir. t968) it was held that specifications "need only be reasonable with respect to the art involved; they need not inform the layman nor disclose what the skilled already possess .... The intricacies need not be detailed ad absurdum."

Applicant respectfully submits that paragraph [0021] sufficiently appraises a person of ordinary skill in the art of" the method mak[ing] use of the generally known slew rate limitation of the LO instability". A person of ordinary skill in the art would therefore understand that there is a correspondence between the known slew rate limitation and the LO instability. Applicant respectfully submits that it is within the skill of a person of ordinary skill in the art that the "correspondence" without limiting the invention may be achieved via various means including, for example: calculation, table lookup, etc.

Examiner Response:

According to the MPEP 2164.01 [R-5], "…Any analysis of whether a particular claim is supported by the disclosure in an application requires a determination of whether that disclosure, when filed, contained sufficient information regarding the subject matter of the claims as to enable one skilled in the pertinent art to make and use the claimed invention. The standard for determining whether the specification meets the enablement requirement was cast in the Supreme Court decision of Mineral Separation v. Hyde, 242 U.S. 261, 270 (1916) which postured the question: **is the experimentation needed to practice the invention undue or unreasonable?**" (emphasis added).

In re Wands, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). See also United States v. Telectronics, Inc., 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) ("The test of enablement is whether one reasonably skilled in the art could make

or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation."

Applicant relies on ¶0021 of the Patent Application Publication to demonstrate the specification enables the limitations of claim 5 to a person skilled in the art. ¶ 0021 does not disclose calculation of a known slew rate limitation based on the instability of a radio frequency local oscillator in said receiver. Examiner disagrees with Applicant's assertion that ¶0021 of the Patent Application Publication of the instant application (10/53735) enables a person of ordinary skill in the art to make and use the claimed invention.

Examiner contends undue experimentation is needed to practice the invention, since the specification does not disclose any calculation of known slew rate limitation.

Claim 10 recites: "...and the known phase slew rate limitation is calculated from the uncertainty of the GPS SV Doppler shift." However, the specification does not disclose a calculation of "the known phase slew rate limitation".

Claim 11 recites: "wherein the known phase slew rate limitation is calculated from both the instability of a radio frequency local oscillator in said receiver and the uncertainty of the GPS SV doppler." As mentioned above, the specification does not disclose calculation of "the known phase slew rate limitation", much less a calculation based on an instability and an uncertainty as specified by claim 11.

Claims 10-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement since undue experimentation is required by one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art.

Claims 23-24, 26 are rejected based on a rationale similar to the one used to reject claims 5, 10-11 respectively.

3. Applicant's arguments, filed 8/15/08 (pages 17-19), with respect to the 35 U.S.C. §103(a) rejection of independent claims 1 and 15, have been fully considered but are moot in view of the new grounds of rejection

Specification

4. The amendment to the specification received on 8/15/08 is acceptable.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-14 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit

[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

Independent claim 1, recites the steps of correlating, crating, defining, crating, assigning, creating, and utilizing which neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process.

Dependent claims 2-14 are also rejected since they at least contain limitations of claim 1.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

7. Claims 5, 10-11, 23-24, 26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 5, recites: "wherein the known slew rate limitation is calculated from the instability of a radio frequency local oscillator in said receiver." However, the specification does not describe or explain any calculation of "the known phase slew rate limitation" based on the instability of a radio frequency local oscillator in said receiver.

According to the MPEP 2164.01 [R-5], "…Any analysis of whether a particular claim is supported by the disclosure in an application requires a determination of whether that disclosure, when filed, contained sufficient information regarding the subject matter of the claims as to enable one skilled in the pertinent art to make and use the claimed invention. The standard for determining whether the specification meets the enablement requirement was cast in the Supreme Court decision of Mineral Separation v. Hyde, 242 U.S. 261, 270 (1916) which postured the question: is the experimentation needed to practice the invention undue or unreasonable?"

In re Wands, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). See also United States v. Telectronics, Inc., 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988) ("The test of enablement is whether one reasonably skilled in the art could make

or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation."

Applicant relies on ¶0021 of the Patent Application Publication to demonstrate the specification enables the limitations of claim 5 to a person skilled in the art. ¶ 0021 does not disclose calculation of a known slew rate limitaition based on the instability of a radio frequency local oscillator in said receiver. Undue experimentation is needed to practice the invention, by a skilled in the art, since the specification does not disclose how the known slew rate limitation is calculated.

Claim 10 recites: "...and the known phase slew rate limitation is calculated from the uncertainty of the GPS SV Doppler shift." However, the specification does not disclose a calculation of "the known phase slew rate limitation".

Claim 11 recites: "wherein the known phase slew rate limitation is calculated from both the instability of a radio frequency local oscillator in said receiver and the uncertainty of the GPS SV doppler." As mentioned above, the specification does not disclose calculation of "the known phase slew rate limitation", much less a calculation based on an instability and an uncertainty as specified by claim
11.

Claims 10-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement since undue experimentation is required by one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art.

Claims 23-24, 26 are rejected based on a rationale similar to the one used to reject claims 5, 10-11 respectively.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1, 3-4, 6, 14-15, 19, 25, 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Stralen (U.S. 6,721,366) in view of Schoolcraft (U.S. 5,237,587), Huff (U.S. 6,477,208), Czaja et al. (U.S. 6,356,595) and Pekarich et al., (U.S. 6,633,615).

With respect to claim 1, Van Stralen discloses: creating a trellis of phase state nodes (Fig. 4, function of CPM detector, column 1, lines 45-56, see description of a trellis structure, and column 5, lines 6-11, where the state nodes for CPM (continuous phase modulation) signals are phase nodes) said creating step comprising: defining a plurality of phase states representing the phases (these are the nodes of the trellis and are phase nodes for the case of CPM); defining possible state transitions from and to each phase state node (column 1, lines 45-50, the joining lines between the possible paths by which transitions between states can be made, see also column 6, lines 7-11);creating paths between phase state nodes in one time interval and phase state

nodes in another time interval according to said possible state transitions (column 5, lines 28-37, sequential computation and accumulation of branch metrics through the depth of the trellis creates paths in the trellis); creating a likelihood metric for each path based on a measured phase of the input signal (Fig. 4 the accumulated likelihood branch metrics λ (A, m) Q(A,m) computed based on y(t) and θ (a measured phase of the input signal), column 6, lines 17-40) used by the Viterbi decoder), utilizing a Viterbi algorithm on said trellis to perform a maximum likelihood estimation of a phase trajectory of the input signal (Fig. 4, output Q(D, m-p) out of port 414o2 of the Viterbi decoder, column 5, lines 38-47 used for phase tracking, and column 7, lines 29-33).

Van Stralen does not expressly teach: correlating said received signal with a local replica of pseudo noise code in a coherent fashion over a plurality of time intervals in said time epoch creating a correlation signal; creating a trellis of evenly distributed phase state nodes at each time interval, said creating step comprising: defining a plurality of phase states representing phases evenly quantized over 0 to 360 degrees; assigning a transition probability to each path; creating a likelihood metric for each path based on an input signal and the transition probability for the path; said measured phase of the correlation signal having a random process approximated utilizing a discrete Markov process; and utilizing a viterbi algorithm on said trellis to perform a maximum likelihood estimation of a phase trajectory of the correlation signal with said quantized resolution of phase states over 0 to 360 degrees throughout the measurement time epoch.

In the same field of endeavor (wireless communications), Schoolcraft discloses: correlating said received signal with a local replica of a pseudo noise code in a coherent fashion over a plurality of time intervals in said time epoch creating a correlation signal (Fig. 2, see blocks 34, “512-chip correlator”, and 22 “PN coder”, column 6, lines 26-28, column 9, lines 30-34, every symbol interval (32 chips) corresponds to the claimed time intervals and the time epoch corresponds to the reception mode time duration).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen based on the teachings of Schoolcraft so that it becomes relatively immune to eavesdropping and jamming (by implementing a spread spectrum modulation/demodulation method as taught by Schoolcraft, column 1, lines 1-9, 17-22, column 2, lines 14-34).

In the same field (CPM demodulation, and trellis demodulation) Huff discloses: creating a trellis of evenly distributed phase state nodes at each time interval (see Fig. 3, trellis diagram, where the phase state nodes are the black dots (corresponding to 32 phase states labeled 0 through 31) and horizontal axis is a symbol time axis, column 12, lines 65-67, through column 13, lines 1-3), said creating step comprising: defining a plurality of phase states representing phases evenly quantized over 0 to 360 degrees (see column 12, lines 65-67, through column 13, lines 1-5, where the states are offset to each other by $2\pi/32$); and utilizing a viterbi algorithm on said trellis to perform a maximum likelihood estimation of a phase trajectory of a signal with said quantized resolution of phase states over 0 to 360 degrees (column 13, lines 29-34, see multiplication by $2\pi/32$ (the quantized resolution of phase states over 0 to 360 degrees).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen based on the teachings of Huff so that demodulation and phase tracking is achieved for evenly spaced phases between 0 to 360 degrees, and the Viterbi algorithm performs phase tracking over 0-360 degrees.

In the field of maximum likelihood decoders, Czaja et al disclose: assigning a transition probability to each path (column 7, lines 16-33); creating a likelihood metric for each path based on an input signal and the transition probability for the path (path metric corresponds to a likelihood metric, column 8, lines 1-6);

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen based on the teachings of Czaja et al.

so that the trellis of Van Stralen converges within a short time interval (Czaja et al. Column 7, lines 20-26).

In the field of maximum likelihood decoders, Pekarich e. al., disclose: a received signal having a random process approximated utilizing a discrete Markov process (see column 1, lines 32-38, description of a ML detector, where the received sequence is a finite-state, discrete time Markov process).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art, to approximate the received phase of Van Stralen, as a maximum likelihood detector provides a maximum a posteriori estimate of a discrete-time Markov process observed in noise (and the viterbi algorithm is reduced to a summation of conditional probabilities).

With respect to claim 3, the system obtained by the modifying Van Stralen further includes: wherein the possible state transitions and the probability of the paths are assigned to reflect properties of said receiver (the trellis (and possible state transitions) of Van Stralen is constructed for a CPM receiver and the probabilities are assigned according to the encoder used to generate the transmitted signals).

With respect to claim 4, the system obtained by modifying Van Stralen further includes: wherein the step of creating possible state transitions for each node is performed based on a known phase slew rate limitation of said receiver (the trellis of Van Stralen is constructed for a CPM signal receiver whose phase transitions (from

node to node in the trellis diagram) are continuous, this corresponds to known phase slew rate limitations).

With respect to claim 6, the system obtained by modifying Huff based on Schoolcraft, includes: wherein the received signal is a direct sequence spread spectrum signal (such a signal corresponds to a signal spread by a PN code, see Fig. 1, Fig. 2 of Schoolcraft, multiplication (i.e. spreading) by PN code blocks 22, and 16, column 1, lines 17-23).

With respect to claim 14, Van Stralen further discloses: wherein said receiver is a mobile receiver (Fig. 4 (illustrates processing of a received signal, y(t)) and column 2 , lines 49-50, invention relates to signal processing within a (receiving) mobile station).

With respect to claim 15, claim 15 is rejected based on a rationale similar to the one used to reject method claim 1 above. Van Stralen further discloses: a down converter for downconverting the received signal, producing a downconverted signal (column 4, lines 32-35, see downconverted signal); Van Stralen does not expressly teach: an antenna for receiving the direct sequence spread spectrum signal; an analog to digital converter to convert the downconverted signal to a digital signal.

In the same field of endeavor (wireless communications), Schoolcraft discloses: an antenna for receiving the direct sequence spread spectrum signal (Fig. 2, receiver, see receiving antenna 12, and Fig. 3, see A/D converter pair 50 and 50', column 6, lines

56-59, column 7, lines 31-34); an analog to digital converter to convert the downconverted signal to a digital signal.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen, based on the teachings of Schoolcraft so that it uses an antenna to capture transmitted signals, and digitizes downconverted signals to process them using a dsp.

Claims 19, 29 are rejected based on a rationale similar to the one used to reject claim 14 above.

10. Claims 2, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Stralen (U.S. 6,721,366) in view of Schoolcraft (U.S. 5,237,587), Huff (U.S. 6,477,208), Czaja et al. (U.S. 6,356,595) and Pekarich et al., (U.S. 6,633,615) as applied to claim 1 and further in view of Bruno et al., "Design and Evaluation of a Soft Output Viterbi Algorithm (SOVA) for use in a Concatenated Coding Scheme", (October 16, 2001).

With respect to claim 2, neither Van Stralen, Schoolcraft, Huff, Czaja, nor Pekarich et al., expressly teach: wherein the Markov process is a first order Markov process.

In the same field of endeavor (viterbi decoders), Bruno et al. disclose: a first order Markov process (page 7, see first half of page, specifically sentence prior to equation [2], see first order Markov equation).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen et al. based on the teachings of Bruno et al. so that the Viterbi algorithm is reduced to a summation of conditional probabilities (see equation [2] on page 7 of Bruno et al.).

Claim 16 is rejected based on a rationale similar to the one used to reject claim 2 above.

11. Claims 7, 8, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Stralen (U.S. 6,721,366) in view of Schoolcraft (U.S. 5,237,587), Huff (U.S. 6,477,208), Czaja et al. (U.S. 6,356,595) and Pekarich et al., (U.S. 6,633,615) as applied to claims 1 , 4, & 15 respectively, and further in view of Lennen (U.S. 6,404,801).

With respect to claim 7 neither Van Stralen, Schoolcraft, Huff, Czaja nor Pekarich et al., expressly teach: wherein the received signal is a global positioning (GPS) coarse/acquisition L1 signal generated by a space vehicle (SV).

In the field of wireless communications (GPS), Lennen discloses: wherein the received signal is a global positioning (GPS) coarse/acquisition L1 signal generated by a space vehicle (SV) (see column 1, lines 42-51 where it is understood that a GPS receiver, receives the mentioned transmitted signals from the GPS satellites (space vehicles)).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen et al. based on the teachings of Lennen so that it processes GPS signals such as the L1 signal so that it is capable to accurately determine its the location and/or time (Lennen, column 1, lines 15-22).

Claims 8,17 are rejected based on a rationale similar to the one used to reject claim 7.

Claim 25 is rejected based on a rationale similar to the one used to reject claim 4 above.

12. Claims 9, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Stralen (U.S. 6,721,366) in view of Schoolcraft (U.S. 5,237,587), Huff (U.S. 6,477,208), Czaja et al. (U.S. 6,356,595) and Pekarich et al., (U.S. 6,633,615) as applied to claims 1 & 15 respectively and further in view of Lucas (U.S. 5,448,600).

With respect to claim 9, neither Van Stralen, Schoolcraft, Huff, Czaja nor Pekarich et al., expressly teach: wherein the received signal is a code-division multiple access (CDMA) pilot signal.

In the same field of endeavor, Lucas discloses: wherein the received signal is a code-division multiple access (CDMA) pilot signal (see column 4, lines 52-56, CDMA pilot).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen based on the teachings of Lucas, so that at the receiver an estimate of the channel response is obtained (based on the received CDMA pilot signal, (Lucas, column 4, lines 52-55).

Claim 18 is rejected based on a rationale similar to the one used to reject claim 9.

13. Claims 12-13, 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Stralen (U.S. 6,721,366) in view of Schoolcraft (U.S. 5,237,587), Huff (U.S. 6,477,208), Czaja et al. (U.S. 6,356,595) and Pekarich et al., (U.S. 6,633,615) as applied to claims 1 & 15 respectively, and further in view of Hulyalkar (U.S. 5,832,041).

With respect to claim 12, neither Van Stralen, nor Schoolcraft, Huff, Czaja or Pekarich expressly disclose: wherein the likelihood metric is created based on a probability distribution function of the phase of said correlated signal.

In the field of phase tracking, Hulyalkar discloses: a probability distribution function of the phase of a received signal (column 4, lines 2-5, unwanted phase is modeled as a Gaussian function).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen et al. based on the teachings of Hulyalkar so that the tracked phase is modeled using a Gaussian function, and based on this modification, the likelihood metrics of Van Stralen are based on the Gaussian probability distribution function of the phase (Gaussian probability distribution functions are widely used in statistical signal processing).

With respect to claim 13, neither Van Stralen, nor Schoolcraft, Huff, Czaja or Pekarich expressly disclose: wherein the approximation is to model the probability

distribution function of the phase as a periodic Gaussian pulse on top of a constant function.

In the field of phase tracking, Hulyalkar discloses: wherein the approximation is to model the probability distribution function of the phase as a periodic Gaussian pulse on top of a constant function. (Fig. 2 distribution and column 4, lines 2-5, unwanted phase is modeled as a Gaussian pulse on top of the constant -65 dB).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen et al. based on the teachings of Hulyalkar to perform signal processing using a Gaussian probability distribution function which is widely used in statistical signal processing.

Claims 27-28 are rejected based on a rationale similar to the one used to reject claims 12-13 above.

14. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Stralen (U.S. 6,721,366) in view of Schoolcraft (U.S. 5,237,587), Huff (U.S. 6,477,208), Czaja et al. (U.S. 6,356,595) and Pekarich et al., (U.S. 6,633,615) as applied to claims 15 and further in view of Cahn et. al., (U.S. 5,535,278)

With respect to claim 20, neither Van Stralen, Schoolcraft, Huff, Czaja nor Pekarich et al., teach: wherein the known signal is a GPS C/A L1 signal.

In the same field of endeavor, Cahn et al., discloses: wherein the known signal is a GPS C/A L1 signal (Fig. 3 GPS receiver, column 12, lines 52-61, column 11, lines 50-67).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the system of Van Stralen based on the teachings of Cahn et al., so that it is used in satellite based GPS applications, that allow for precise determination of a location (Cahn et al., column 1, lines 37-43).

Claims 21-22 are rejected based on a rationale similar to the one used to reject claims 3-4 above.

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abbaszadeh et al. (U.S. 6,370,201)

Nordman (U.S. 7,120,207)

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SOPHIA VLAHOS whose telephone number is (571)272-5507. The examiner can normally be reached on MTWRF 8:30-17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571 272 3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SOPHIA VLAHOS/
Examiner, Art Unit 2611
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